

Ship Jan 6th, 2017

Work Order ID **154101**

154101

Page 1

Thursday, December 01, 2016 1:51:43 PM

Item ID: D5046-1

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Co-Pilot Collective Head

Start Date: 12/5/2016 Start Qty: 2.00 ***2***

Cust Item ID:

Required Date: 12/14/2016 Req'd Qty: 2.00 ***2***

Customer:

Reference:

Approvals: Process Plan: VS 12/12/16 Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
----------	--------------

D5046	B
-------	---

100	Cut blanks as per folio	0.00							DAS 08 3-09
-----	-------------------------	------	--	--	--	--	--	--	-------------------

100

Bandsaw

Memo

0.00

Da 16-12-04

5

φ

Jeaspa Bandsaw

CUT BLANK AT 5.500"

110

0.07

110

HAAS 1

Memo

0.16

Da 16-12-04

5

φ

HAAS CNC vertical machine #1

MACHINE AS PER DWG & FOLIO FB296/ D5046-1

FOLIO REV: AA

DWG REV: B

DO NOT BUFF OR POLISH PART

DEBURR

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval		
Description Work Order Deviation				Disposition				Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY							
Environment ☐	☐ No Re-verification	☐ Pressure/Forced	☐ Temperature/Cure	☐ Power Loss/Surge	☐ Positioned Wrong				
Design ☐	☐ Operator	☐ Bending	☐ Set-up	☐ Folio/Program	☐ Outside Dimensions				
Doc/Data ☐	☐ Offset/Setup	☐ Centre Not Concentric	☐ BOM/Route	☐ Grain	☐ Over/Under tolerance				
Equip/Tooling ☐	☐ Supplier	☐ Cracks	☐ Broken/Damage/Defect	☐ Weld	☐ Part Incorrect				
Handling/Pre ☐	☐ Training	☐ Crimp/Kink/Ripple/Wave	☐ Inspection Incomplete/Unqualified	☐ Wrong Stock Pulled	☐ Part Lost/Missing				
Material ☐	☐ Use for Testing	☐ Cuffs	☐ Contamination	☐ Out of Sequence	☐ Part Moved				
Internal Transport ☐	☐ Poor Information	☐ Crushing	☐ Countersink	☐ Off-set	☐ Drawing				
Tribal Knowledge ☐	☐ Rushing	☐ Heat Treat	☐ Cut Too Short	☐ Mislabeled	☐ Finish				
LOA ☐	☐ Product Improvement	☐ Wave/Twist in Tube	☐ Instructions Incomplete/Unclear	☐ Fit/Function	☐ Misread				
Substation ☐	☐ Process Improvement	☐ Marks/Chatter	☐ Drill Holes	☐ Misaligned/off center	☐ Turning Sequence				
Past Expiry Date ☐	☐ Manufacturing Process								
Misidentified ☐	☐ Past Due	OTHER :							

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WORK ORDER NON-CONFORMANCE / UPDATE



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Date :		Step #:		QTY Effective :			MRB (QS1042) Approval		
Description Work Order Deviation				Disposition				Completed By	
								Lead hand / Supervisor Approval Verification	
Root Cause		FAULT CATEGORY							
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154101

Page 3

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Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Co-Pilot Collective Head

Start Date: 12/5/2016 Start Qty: 2.00

2

Cust Item ID:

Required Date: 12/14/2016 Req'd Qty: 2.00

2

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150	QC8- Inspect parts - second check	0.00							
150									
QC	Memo	0.01				5	0		DAS 14 9-8
Quality Control									16/12/06
160	Identify as per dwg & Stock Location: <u>W401</u>	0.00							
160									
Packaging	Memo	0.00				5	0		16-12-12
Packaging	LOCATION: WA002								
170	QC21- Final Inspection - Work Order Release	0.00							
170									
QC	Memo	0.03							16/12/13
Quality Control									

16-12-12

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width: 100%; border: none;"> <tr> <td style="border: none;">Skid-tube ☐</td> <td style="border: none;">Cross tube ☐</td> <td style="border: none;">Water Jet ☐</td> <td style="border: none;">Engineering ☐</td> </tr> <tr> <td style="border: none;">Machining ☐</td> <td style="border: none;">Small Fab ☐</td> <td style="border: none;">Prod. Eng. Coord. ☐</td> <td style="border: none;">Quality ☐</td> </tr> <tr> <td style="border: none;">Thermoforming ☐</td> <td style="border: none;">Finishing ☐</td> <td style="border: none;">Rec/Store/Packaging ☐</td> <td style="border: none;">Other ☐</td> </tr> <tr> <td style="border: none;">Large Fab ☐</td> <td style="border: none;">Composite ☐</td> <td style="border: none;">Supplier ☐</td> <td style="border: none;"></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
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Picklist Print

Thursday, December 01, 2016 1:51:48 PM

Page 1

Work Order ID: 154101

154101

Parent Item: D5046-1

D5046-1

Parent Item Name: Co-Pilot Collective Head

Start Date: 12/5/2016

Required Date: 12/14/2016

Start Qty: 2.00

Required Qty: 2.00

Comments: IPP REV. A NEW ISSUE JFS 14/04/11 VERIFIED BY:DD
IPP REV. B MAT'L SIZE HAS CHANGED AS PER REV.B JFS 15/09/23
VERIFIED BY:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
M6061T6B06.000X02.0 00		Purchased	No			100	f	6.0250	0.46	0.968421			

M6061T6B06 000X02 000

alum bar 6.00 x 2.00

**

B. 16-12-04

Location

Loc Qty

Loc Code

MAT

6.025

6.025

→ m133536

2.3125

DQA: _____ Date: _____

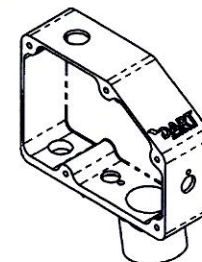
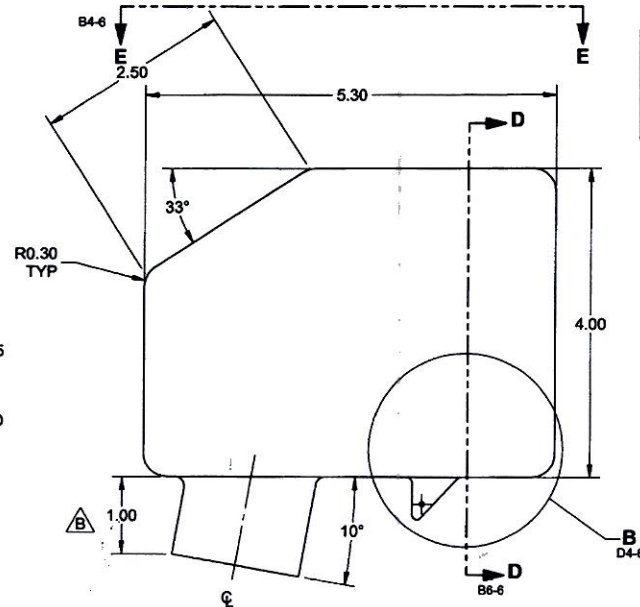
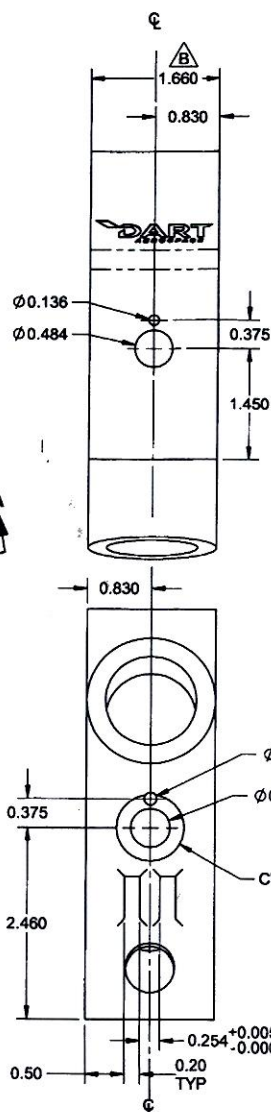
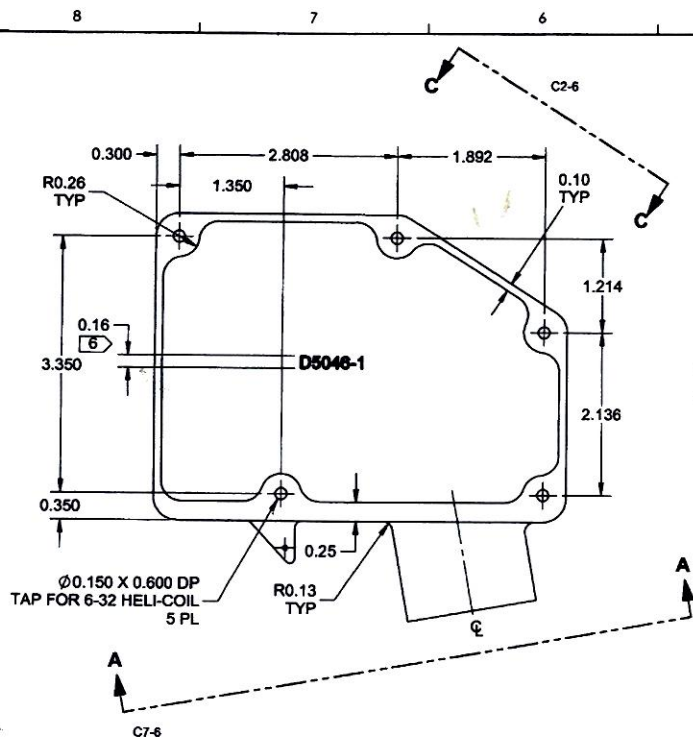
WORK ORDER NON-CONFORMANCE / UPDATE



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Work Order update only ☐

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Past Expiry Date ☐	☐ Manufacturing Process								
Misidentified ☐	☐ Past Due	☐ OTHER :							



- NOTES:
- 1) MATERIAL: 6061-T6/T651/T6510/T6511/T62 ALUMINUM BAR
QQ-A-225/8 OR AMS-QQ-A-225/8 (OR AMS 4117/4128/4115/4116)
OR QQ-A-200/8 OR AMS-QQ-A-200/8 (OR AMS 4160)
OR ASTM B211 OR ASTM B221
REF DART SPEC M6061T6B
 - 2) FINISH: NONE
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY PER QSI 044 6.3 IN THIS AREA TO MAX DEPTH
OF 0.010 WITH A MIN. TOOL RAD OF R0.010
 - 7) WEIGHT: 0.80 lbs

D5046-1 CO-PILOT COLLECTIVE HEAD (205)

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 154101

RELEASED
02 2015 JUL 02

APPROVED	DESIGN	VS	DART AEROSPACE USA, INC.	
	DRAWN	VS	KENT, WA	
	CHECKED	RF	DRAWING NO.	REV. B
	MFG. APPR.	JFS	D5046	SHEET 5 OF 12
	APPROVED	HS	TITLE	SCALE
	DE APPR.	DS	CO-PILOT COLLECTIVE HEAD	NTS
DATE	14.11.20	COPYRIGHT © 2014 BY DART AEROSPACE USA, INC. THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE USA, INC.		

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

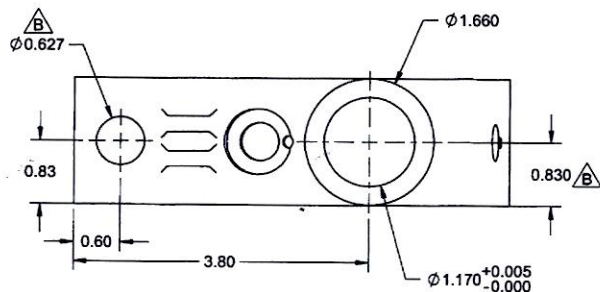


QA Closed: _____ Date: _____

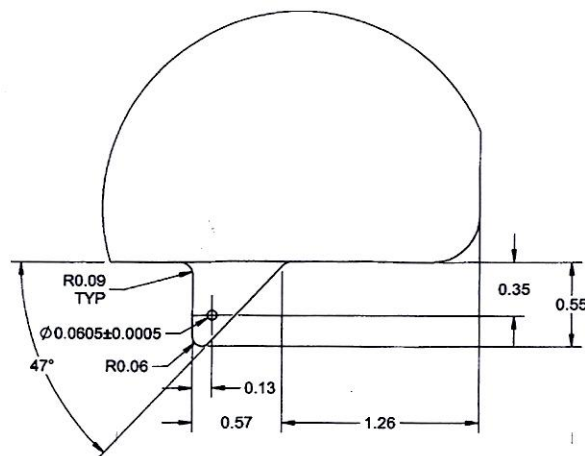
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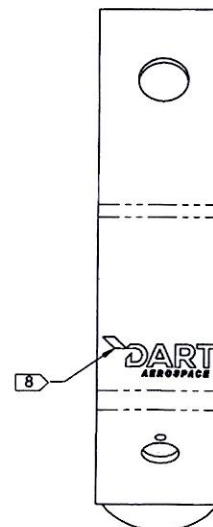
8 7 6 5 4 3 2 1



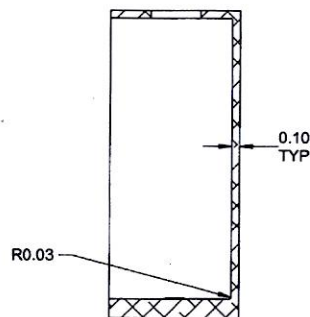
VIEW A-A
B7-5



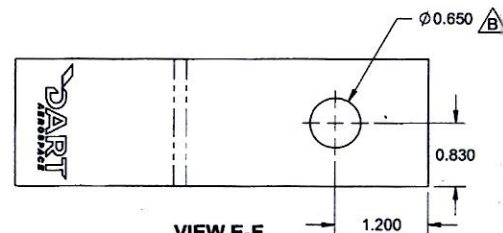
DETAIL B
C2-5



VIEW C-C
D6-5



SECTION D-D
C2-5



VIEW E-E
D3-5

RELEASED
A.P. 2015 JUL 02

- NOTES:**
- 1) MATERIAL: N/A
 - 2) FINISH: N/A
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: N/A
 - 7) WEIGHT: 0.80 lbs
 - 8) ENGRAVE "DART" LOGO AS SHOWN 0.003-0.005 DP

D5046-1 CO-PILOT COLLECTIVE HEAD (205)
DETAIL VIEWS

APPROVED	DESIGN	VS	DART AEROSPACE USA, INC. KENT, WA	
	DRAWN	VS		
	CHECKED	RF	DRAWING NO.	REV. B
	MFG. APPR.	JFS	D5046	SHEET 6 OF 12
	APPROVED	HS	TITLE	SCALE
	DE APPR.	DS	CO-PILOT COLLECTIVE HEAD	NTS
DATE		14.11.20	COPYRIGHT © 2014 BY DART AEROSPACE USA, INC. THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE USA, INC.	

8 7 6 5 4 3 2 1

DQA: _____ Date: _____



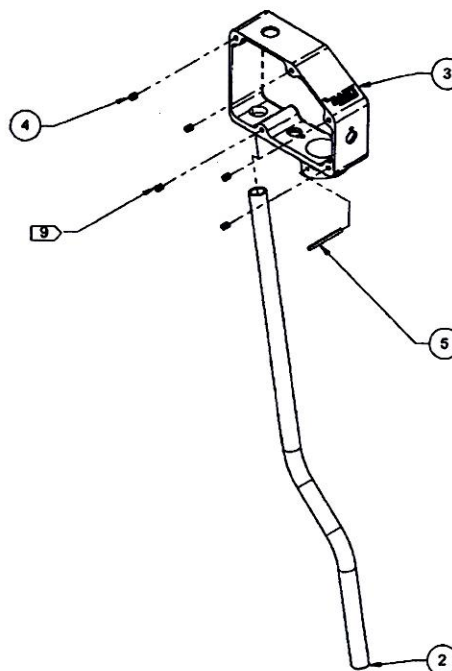
WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER : ☐					

ITEM	QTY	P/N	DESCRIPTION
1	X	D5046-041	CO-PILOT COLLECTIVE HEAD ASSEMBLY (205)
2	1	D4410-7	CONDUIT
3	1	D5046-1	CO-PILOT COLLECTIVE HEAD
4	5	90296A108	HELI-COIL INSERT (6-32 X 0.276)
5	1	MS171539	PIN



117705 MJS
14-05-01

D5046-041 WELDING DETAIL

RELEASED
2014-04-06
WJ

NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: ANODIZE BLACK PER MIL-A-8625F TYPE I OR IB OR IC OR II OR IIB CLASS 2 AFTER WELDING
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY PER QSI 044 6.1
- 7) WEIGHT: 0.91 lbs
- 8) WELD PER DART QSI 004
- 9) INSTALL AFTER ANODIZING

D5046-041 CO-PILOT COLLECTIVE HEAD ASSEMBLY (205)

A		NEW ISSUE		VS	14.01.22
REV.	DESCRIPTION			BY	DATE
DESIGN	VS	DART AEROSPACE USA, INC.		REV. A	
DRAWN	VS	KENT, WA		SHEET 1 OF 12	
CHECKED	DC	DRAWING NO. D5046		SCALE	
MFG. APPR.	JFS	TITLE		NTS	
APPROVED	HS	CO-PILOT COLLECTIVE HEAD			
DE APPR.	DS				
DATE	14.01.22				

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APPROVED

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width: 100%; border: none;"> <tr> <td style="border: none;">Skid-tube ☐</td> <td style="border: none;">Cross tube ☐</td> <td style="border: none;">Water Jet ☐</td> <td style="border: none;">Engineering ☐</td> </tr> <tr> <td style="border: none;">Machining ☐</td> <td style="border: none;">Small Fab ☐</td> <td style="border: none;">Prod. Eng. Coord. ☐</td> <td style="border: none;">Quality ☐</td> </tr> <tr> <td style="border: none;">Thermoforming ☐</td> <td style="border: none;">Finishing ☐</td> <td style="border: none;">Rec/Store/Packaging ☐</td> <td style="border: none;">Other ☐</td> </tr> <tr> <td style="border: none;">Large Fab ☐</td> <td style="border: none;">Composite ☐</td> <td style="border: none;">Supplier ☐</td> <td style="border: none;"></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
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Date :		Step #:		QTY Effective :			MRB (QSI042) Approval																		
Description Work Order Deviation				Disposition				Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval																	
Root Cause		FAULT CATEGORY																							
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		OTHER : ☐																							

DART AEROSPACE LTD		Work Order:	154101
Description: Co-Pilot Collective Head		Part Number:	D5046-1
Inspection Dwg: D5046 Rev: A B		Page 1 of 2	

FIRST ARTICLE INSPECTION CHECKLIST

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
3.350	+/-0.005	3.350	✓		H-6	31006
R0.26	+/-0.030	R0.260	✓		R-6	ref.
0.300	+/-0.005	0.301	✓		Vern	GA-13
1.350	+/-0.005	1.350	✓		H-6	31006
2.808	+/-0.005	2.808	✓		Vern	GA-13
1.892	+/-0.005	1.892	✓		H-6	31006
0.10	+/-0.030	0.100	✓		Mic	GA-03
1.214	+/-0.005	1.214	✓		H-6	31006
2.136	+/-0.005	2.136	✓		"	"
0.35	+/-0.030	0.351	✓		Vern	GA-13
Ø0.116	+0.004/-0.001	_____	_____		_____	_____
R0.13	+/-0.030	R0.125	✓		R-6	ref.
0.25	+/-0.030	0.249	✓		Mic	GA-03
Ø0.150	+0.005/-0.001	Ø0.154	✓		Vern	GA-13
1.66	+/-0.030	1.662	✓		"	"
0.830	+/-0.005	0.831	✓		"	"
Ø0.136	+0.005/-0.001	0.136	✓		caliper	JCL-08
Ø0.484	+0.006/-0.001	0.485	✓		↓	
0.375	+/-0.010	0.375	✓		↓	
1.450	+/-0.010	1.450	✓			
5.30	+/-0.030	5.305	✓		Vern	GA-13
4.00	+/-0.030	3.998	✓		"	"
1.00 ± 0.70	+/-0.030	1.001	✓		H-6	31006
10°	+/-0.5°	10°	✓		Angle M.	CNC-17
33°	+/-0.5°	33°	✓		"	"
R0.30	+/-0.030	R0.300	✓		R-6	ref.
2.50	+/-0.030	2.500	✓		Vern	GA-13
2.460	+/-0.010	2.461	✓		H-6	31006
0.375	+/-0.010	0.375	✓		"	"
0.830	+/-0.010	0.831	✓		Vern	GA-13
Ø0.160	+0.005/-0.001	Ø0.161	✓		"	"
Ø0.500	+0.006/-0.001	Ø0.500	✓		"	"
Ø0.850 x 0.150 DP	+/-0.010 x +/-0.010	Ø0.861 x .150	✓		"	"
0.254	+0.005/-0.000	0.255	✓		"	"
0.20	+/-0.030	0.199	✓		"	"
0.50	+/-0.030	0.504	✓		"	"
Ø0.627	+0.008 +/-0.010 -0.001	Ø0.629	✓		"	"

DART AEROSPACE LTD		Work Order:	154101
Description: Co-Pilot Collective Head		Part Number:	D5046-1
Inspection Dwg: D5046 Rev: A		Page 2 of 2	

FIRST ARTICLE INSPECTION CHECKLIST

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
0.83	+/-0.030	0.831	✓		Vern	GA-13
0.60	+/-0.030	0.600	✓		H-G	31006
3.80	+/-0.030	3.800	✓		"	"
Ø1.660	+/-0.010	Ø1.660	✓		Mic	GA-02
Ø1.170	+0.005/-0.000	Ø1.172	✓		"	"
R0.03	+/-0.030	R0.035	✓		R-G	ref.
0.10	+/-0.030	0.105	✓		H-G	31006
Ø0.615 0.50	+0.008/-0.001	Ø0.651	✓		Vern	GA-13
0.830	+/-0.010	0.831	✓		"	"
1.200	+/-0.010	1.200	✓		H-G	31006
0.55	+/-0.030	0.551	✓		"	"
0.35	+/-0.030	0.354	✓		"	"
1.26	+/-0.030	1.245	✓		Vern	GA-13
0.57	+/-0.030	0.580	✓		"	"
0.13	+/-0.030	0.125	✓		H-G	31006
R0.06	+/-0.030	R0.06	✓		R-G	ref.
R0.09	+/-0.030	R0.09	✓		"	"
Ø0.0605	+/-0.0005	Ø0.061	✓		gage pin	ref.
47°	+/-0.5°	47°	✓		Angle M.	CNC-17

Measured by: D.A. ^{DAS} 08	Audited by: 14 ^{DAS} 9-89	Preliminary Approval:		
Date: 16-12-05 ⁹⁻⁸⁹	Date: 16/12/06	Date:		
Rev	Date	Change	Revised by	Approved
A	14.04.23	New Issue	KJ	